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Wayne

Mike

April

June 12, 2015

Division of Water Quality
Mr. Walter L. Baker, P.E., Director
P.O. Box 144870
Salt Lake City, Utah 84114-4870

Submitted Via Email:

Division of Water Quality
Mr. Dan Hall, Environmental Program Manager
dhall@utah.gov
Ms. Jenny Potter, Support Services Supervisor
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**Re: Written Comments in Response to Public Notice of Intent to Issue a
Ground Water Discharge Permit and Related Construction Permit;
Permit No. UGW070003**

Dear Mr. Baker:

Hunt Consolidated, Inc. ("Hunt") welcomes this opportunity to respond to the Utah Department of Environmental Quality's ("DEQ" or, the "Agency") solicitation for public comments regarding the Agency's intent to issue both the ground water discharge permit and associated construction permit discussed below, to Green River Resources, Inc. ("GRR") and American Sands Energy Corp. ("ASE") (collectively, "ASE"). Hunt submits the comments herein based in part on consultation and support from technical experts at Burns & McDonnell, an environmental engineering firm retained by Hunt to assist in review and assessment of the materials submitted by ASE in support of its applications. The individuals who took part in the review, and their respective areas of training and experience are as follows:

- A. Dr. Greg Howick, Burns & McDonnell's Senior Aquatic Ecologist;
- B. Dan Jelinek, Senior Environmental Scientist in Remediation Services in Burns & McDonnell's St. Louis office; and,
- C. Jeff Binder, Hydrogeology Section Manager for Remediation Services in Burns & McDonnell's Kansas City office.

In addition to the foregoing outside consultants, in preparing these comments Hunt also relied upon its own internal review of the materials submitted by ASE by individuals within the organization with technical training, education and experience related to hydrology, hydrogeology, civil engineering and environmental engineering. Individuals with Hunt who

have first-hand knowledge concerning day-to-day operations and physical and environmental conditions on the property underlying and adjacent to the area ASE's activities would affect also have contributed to the information contained herein.

1. Hunt's Opposition to the Permit and Background Information. Hunt appreciates the Agency's consideration of the information provided in these Comments. As the Comments explain, ASE has failed to comply with the minimum statutory and regulatory requirements mandated by DEQ's permitting process. The permits discussed herein unquestionably fail to address the precise environmental concerns and serious threats to water quality the Agency's regulations and permitting processes are designed to prevent. Based on this failure, and the questions left unresolved by the permit applications as discussed herein, Hunt respectfully urges the Agency to exercise its clear and expansive administrative discretion and authority to deny ASE's requested permits. As a property owner with substantial economic investment and resources dedicated to current operations on the land that will be directly affected by the activity proposed by the permits, including long-term uses that rely on the continued safety and existing integrity of all water resources located within the Hunt property boundaries, Hunt firmly opposes ASE's activity that as proposed, poses a serious and immediate threat of significant water degradation.

Under its Permit Application for a Ground Water Discharge Permit and Related Construction Permit, Permit No. UGW070003 (the "Permit"), ASE proposes to construct and operate an underground mine and processing facility for extraction of tar sands from private property located within the historical Preston Nutter Ranch (the "Ranch"), the surface of which is owned one hundred-percent (100%) by Hunt. Hunt owns and operates the 48,000-acre working ranch, with its main entrance currently established in the same location as the center of substantial industrial operations under the proposed Permit. The Permit identifies lands for the "Facility Location" that are located approximately six (6) miles east of Sunnyside, more specifically described as follows:

Township 14 South, Range 14 East, S.L.B.M.
Portions of Sections 2, 3 and 10

(containing approximately 160 acres)

(the so-called, "Affected Area"). In addition to owning several thousand acres surrounding the "Affected Area," Hunt is the record owner of the entire surface estate, and all or a substantial percentage of the underlying mineral estate for nearly the entire Affected Area. Hunt also owns real property interests in state water rights located within the "Affected Area." Therefore, as an interested party, Hunt submits the following comments pursuant to Utah law as codified in Utah Code Ann. § 19-1-301.5, in contemplation of participating in an adjudicative proceeding should the Agency ultimately approve a Permit Order. Hunt's comments in opposition to the Permit and corrections to the same, along with supporting documentation and references where applicable, accompany this letter.

2. Permit Information and Issuing Legal Authority. The Director of the Utah Division of Water Quality ("Director") issued the Public Notice of Intent to Issue a Ground Water Discharge

Permit under authority of the Utah Water Quality Act (the "Act"), codified in Utah Code Ann. § 19-5-106(g), and the Utah Administrative Code (the "Utah Code") R317-6; the Director issued the accompanying Construction Permit pursuant to authority under Section 19-5-106(2)(f) of the Act, and R317-1-2.2 of the Utah Code (collectively, the "Permits"). The Permit fails to meet several requirements set forth in the foregoing statutory and regulatory frameworks, as further described herein. DEQ, as the state agency charged with regulating and enforcing the administrative framework established to protect the state's water resources, has considerable discretion and authority in determining whether a permit application meets the standards and complies with requirements that will ensure such protection of resources. Under Utah law DEQ may, at its discretion, deny permit applications that fail to meet minimum requirements, or it may return the application for lack of information and require supplemental materials from the applicant. Hunt respectfully urges DEQ to exercise its agency discretion and authority to protect water resources and deny the Permit for ASE's failure to comply with legal and procedural requirements.

3. Statement of Basis and Failure to Accurately Establish Appropriate Boundaries for Area Affected by Proposed Operations. The Permit's Statement of Basis minimizes the potential for degradation of water resources and underestimates the cumulative threat to the area impacted by the proposed operations. As a preliminary matter, the Permit fails to adequately support the basis for limiting the "Affected Area," to a summarily-determined and wholly inadequate 160-acre parcel of property located within approximately one mile of the headwaters to a sensitive state water resource, a drainage known as Range Creek. By limiting the geographic reach of its operations to the so-called "Affected Area," ASE has attempted to avoid addressing serious environmental concerns otherwise implicated by the proposed operations in this sensitive mountain riparian environment. Furthermore, the Permit does not present supporting information describing standards or protocols applicable to state or federal requirements for defining an Affected Area. In addition, the Permit also fails to comply with Part B.1. of DEQ's Permit Application that requires applicants to specify the precise location for potential points of discharge by quarter-quarter descriptions within each affected Section. Instead, the Permit identifies "portions of Sections 2, 3 and 10" with an entire Township and Range, making it difficult to comment on the precise water resources potentially at risk from permitted activities. Nevertheless, it is clear that by implicating even portions of Sections 2, 3 and 10, ASE intends to locate a majority of infrastructure and permanent facilities at the entrance to the historic Nutter Ranch, and extend substantial surface disturbing activities well-beyond the limited outline of the "Affected Area."

The premise of ASE's claim regarding the Permit's limited impact on state water resources relies on limiting the Affected Area to the 160-acre portion of the land, yet there is ample evidence in the Permit itself that the total area affected by the proposed operations will be much greater. At a minimum, ASE should be required to provide additional information to establish the limited acreage and surface area. Extension of the Affected Area would have significant implications for surrounding ground water disturbance and potential for contamination, and ASE should be required to address the potential harm to water beyond the limited acreage. In support of its contention that the "Affected Area" does not accurately reflect

the area that should be subject to DEQ oversight and monitoring pursuant to any Permit eventually approved, Hunt also submits the following:

A. As mentioned above, the Ranch property extends to the sensitive Range Creek Drainage, and the proposed Facility Location is in close proximity, within less than one mile of the headwaters of that sensitive area. The North Springs that forms the beginning of the entire Range Creek Drainage is within one-half mile of the tailings pile and pond identified in the Permit materials submitted by ASE. Nevertheless, the Permit fails to identify these potential areas for monitoring or compliance with Permit conditions because ASE has unilaterally determined that those areas are outside the Affected Area. The topography at the location of the proposed facilities makes limiting the area of potential impact in the manner attempted by ASE virtually a physical impossibility.

B. On Figure 2 of the Permit, the green-shaded area above the mine portals were not identified in the figure legend, but the area appears to be the benching described in Appendix G (Preliminary Stability and Hydrology Analysis). Despite the fact that this benching is a land-disturbing activity, this area was not included in the Affected Area. The Permit fails to account for this additional disturbance in describing the Affected Area.

C. Also on Figure 2 of the Permit, given the steepness of the slope the mine haul road traverses when heading south from the mine portal, the road, which will need to be wide enough to accommodate two-way traffic of very large ore trucks, will likely need substantial amounts of cut and fill on either side. Consequently, the area affected by ground disturbance will likely be much wider than depicted in the Permit. The Affected Area as defined in the Permit does not account for this additional disturbance.

4. Failure to meet Permit Application Requirements from Part A – General Facility Information. The Permit fails to meet requirements for establishing sufficient financial assurance as required by R317-4-5-6. ASE does not provide detailed information about closure costs, or its ability to meet those obligations, and the public record does not disclose any separate evaluation beyond bond. Absent this information, the Agency should deny the Permit. In addition, responsibilities for compliance and financial assurance (beyond any bond), are unclear in the Permit. The cover page names American Sands Energy Corp.; however, the application was prepared for Green River Resources, Inc.

In addition, in Section 2, Schedule B of Appendix A (Ownership Information), the title insurer lists twenty-two (22) exceptions to its insurance policy. One exception of note, identified at number twenty (20), refers to an oil and gas lease recorded on September 29, 2006, as Entry No. 119668, in Book 629, Page 686, and “any subsequent Assignments, Modifications, etc. thereof; an Assignment, Bill of Sale and Conveyance from Petro-Canada Resources (USA) Inc., a Colorado Corporation, to Questar Exploration and Production Company, recorded April 13, 2010, as Entry No. 805291, in Book 720, Page 266. These potential title issues further complicate the liability and financial responsibility of the parties for funding any post-operation clean up, if necessary. This is a potentially significant omission. By ASE’s own calculations, there may be 330,000 kilograms (363.8 tons) of solvent buried with the tailings in the landfill

after only 5 years of operations, which does not include waste materials backfilled into the mine. Nevertheless, the Permit does not address the costs associated with potential remediation requirements, nor does it address liability for the same in the face of leasehold ownership disputes that may arise due to the aforementioned title insurance policy exceptions. The Permit also fails to address costs associated with land value loss due to placement of a tailings landfill/impoundment and backfilled underground mine with residual solvent on Ranch property. This is a potential issue regardless of whether the waste is categorically excluded from Resource Conservation Recovery Act requirements.

5. Failures in Hydrologic Report and Description, Ground Water Discharge Control Plan and Compliance Monitoring Plan

A. The groundwater underlying the "Affected Area," particularly the ore processing facility and the tailings disposal site identified in the Permits is Class IA "Pristine Water" as defined in Utah Code R317-6-3. Although ASE indicates planned measures will reduce inherent risks, the potential for release to the environment due to system/mechanical failures and human error remains. Even with the proposed safeguards and engineering controls, there are numerous leak and spill potentials through the process, storage and transportation of solvent, bitumen, and fuels, as well as with the on-site storage and disposal of tailings and other process residuals/wastes. The Permit fails to address these issues in any contingency or corrective action plan, as required by the permit application.

B. Furthermore, the Permit fails to demonstrate that Best Available Technology contemplated by the Permit will meet maximum protection standards required for Class IA ground water set forth in R317-6-4.2.A. The regulations define Best Available Technology as "the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs." R317-6-1. The regulations also define Best Available Technology Standard as "a performance standard or pollutant concentration achievable through the application of best available technology. R317-6-1. In Section 1.A. of the Permit, ASE defines "Authorized Construction" as best available technology ("BAT") for purposes of the Permit. However, it is commonly understood, and ASE acknowledges that the technology to process the bitumen is proprietary and new, specifically related to the proprietary solvents. Therefore, no other technology exists that is comparable when dealing with dry sand tailings with a residual solvent content of 25 mg/kg or less 10% moisture content. The Agency should request additional information to justify the BAT determination. Moreover, data provided in the Permit is based solely on prototype trials of the process. As such, the process is largely unproven, leaving process-related environmental, health, and safety risks and potential environmental impacts of residuals management unaddressed by more specific regulatory standards.

At a minimum, ASE should be required to provide additional process data and evaluation of the technology. Constructing and operating this new and unproven technology over a shallow, Class IA aquifer is not prudent, and in the absence of ASE demonstrating compliance with protective requirements, the Agency should not approve the Permit under R317-6-6.4

C. The Permit purports that bitumen solvent (bitsol) mixture stream from the washing system water separator will be stored in tanks and used for dust control in the underground mine. However, the Permit fails to address whether the residual solvent content of the water has been assessed to determine its suitability and safe and environmentally sound use for that purpose.

D. The Permit indicates that the ore stockpile will be covered to prevent stormwater infiltration, but it fails to discuss how connate water seepage into the ground from the ore storage area(s) will be prevented.

E. In Section 3, the statements that shallow groundwater flow does not move downward and that vertical movement is inhibited at greater depths are conjecture and not confirmed through testing.

F. In Section 5.2, the data provided on the chemical, physical, radiological, and toxicological characteristics of any effluent or leachate that has the potential to discharge to ground water does not appear adequate to meet the requirements of R317-6-6.3F for Ground Water Permit Application - Waste Characterization.

G. In Section 5.2, the stated solvent concentration of 2 to 25 parts per million in the tailings basically says nothing about potential impacts to human health and the environment. The material safety data sheet indicates a specific gravity (SG) for the solvent of 1.30 - 1.33 @ 20 °C while the SG of water is 1 @ 20 °C. The solvent also has a reported molecular weight of 111.3429, as opposed to water, which is 18.0153. As such, the proprietary solvent is a dense non-aqueous phase liquid (DNAPL) and if released into an aquifer would be extremely problematic. If a DNAPL is released into the subsurface, it can pool on the uppermost impermeable (lower confining) unit of the aquifer and bleed off dissolved contaminants over time. DNAPLs are difficult if not impossible to fully remediate in the subsurface (particularly in bedrock) because, although they might pool, they have a propensity to break into residual pocket or pockets that may not be recoverable or treatable¹

H. The application previously stated that lithologic conditions would inhibit the downward movement of contaminants and Section 8.4 states the "semi-sealing" fractures/joints would prevent vertical migration. If the fractures/joints are semi-sealing, then there is the potential that a DNAPL could overcome the pore pressure in the fracture apertures to migrate downward and impact the aquifer.

I. Infiltration galleries in contact with fractured bedrock that allow for recharge of the shallow groundwater system and North Spring also have the potential to act as preferential pathways for contaminant migration.

¹Schwille, F. 1988. *Dense Chlorinated Solvents in Porous and Fractured Media: Model Experiments*. Lewis Publishers. Chelsea, Michigan.

J. Due to reported limited recharge area, the need to protect the groundwater resource is paramount and the diversion of onsite process/non-contact water increases the potential for impact in the event of a release. No site-specific hydrogeologic data related to groundwater flow or the potentiometric surface for the shallow aquifer has been provided in the permit application.

K. ASE's reference to water occurring at 400 to 420 feet below ground surface (bgs) at less than 2 gallons per minute is irrelevant when considering the potential impacts from the proposed facility to the uppermost shallow groundwater aquifer. Borings completed by Amoco in 1981 within and directly adjacent to proposed dry material impoundment footprint, A-14 and A-17 (see Section 9.4.2), encountered water at 65 and 70 feet bgs, respectively. Although reported to be under artesian conditions, which could have been due to confining conditions and/or the result of hydraulic head caused by steep terrain, it is relevant that notable groundwater is present at the site at less than 100 feet bgs.

L. The MSDS for the solvent is included as Appendix E of the groundwater discharge permit application. It states that the solvent "should not be used or disposed of in any manner where it can enter or be mixed with ground or surface water. All materials containing the product, as well as the product itself, should be sealed in containers for disposal in accordance with all applicable local, state and federal regulations." While surface run-off protective measures appear to be planned, the long-term risk of entering ground water remains, particularly if the compacted landfill clay liner and cap system and the process area ore stockpile(s) (if any materials awaiting disposal are stored in the process area that contain solvent) controls fail, or if solvent residuals or contaminants in the waste ore placed in the underground mine become mobile. The Permit also fails to address whether the impoundment/landfill or underground mine should be considered as adequate for safe disposal, in light of the MSDS statement that all materials containing the solvent should be sealed in containers for proper disposal.

M. Appendix C of Hydrology of North Spring and Bruin Point is a URS memo dated Sept. 30, 2014 summarizing preliminary HELP Model results. The Permit fails to account for certain limitations inherent in the HELP Model when applied to the proposed operations; and as such, the Permit does not adequately address certain conditions affecting the Model's conclusions. Proper application of HELP models and interpretation of results are critical components of establishing reliable conclusions. Inappropriate application or failure to understand limitations of the HELP model can easily result in misapplication or misinterpretation of results. This in turn can lead to an improper design of the landfill drainage system.

The report "The Hydrologic Evaluation of Landfill Performance (HELP) Model", which was funded by United States Environmental Protection Agency under Interagency Agreement No. DW21931425 to the U.S. Army Engineer Waterways Experiment Station (WES), describes the assumptions and limitations associated with use of the model. As just one example the report, attached hereto as Exhibit "A", describes the following limit of applicability: "Several relations must exist between the moisture retention properties of a material. The porosity, field capacity and wilting point can theoretically range from 0 to 1 in units of volume per volume, but

the porosity must be greater than the field capacity, and the field capacity must be greater than the wilting point...The initial soil moisture content cannot be greater than the porosity or less than the wilting point. If the initial moisture contents are initialized by the program, the moisture contents are set near the steady-state values. However, the moisture contents of layers below the top liner system or cover system are specified too high for arid and semi-arid locations and too low for very wet locations..."

From another source, Landfilldesign.com indicates that the HELP Model "grossly underestimates" the water removal rate into the drainage systems, resulting in undersized drainage systems. Under-designed drainage systems cause a saturated condition in the overlying soil layer, and the "detrimental effect of seepage force can be catastrophic especially on side slopes in landfill capping systems."

There is no indication in the memo that such possibilities or shortcomings were considered or addressed in the interpretation of the HELP model results.

The Memo also references, "Preliminary HELP Model Results," but does not indicate whether subsequent modeling has been performed, and if so, whether any results have been evaluated, or the findings of said results result in changes to the Preliminary Model. ASE should also be required to provide additional information regarding this issue.

N. Similarly, the apparently anomalous detection of groundwater at 400-420 bgs in a Garden Gulch Member well is not understood although a possible cause is speculated to be seepage from above through one or more wells. ASE should examine the cause of the seepages, and the Permit should address the determined cause(s), as well as the proper plugging/sealing of any wells found to be causing the seepage.

In addition, the Permit states that surface water infiltration into groundwater is controlled largely by fractured bedrock and the low-permeability oil shale and tar sand layers. However, the Permit fails to address how removal of the shale oil/tar sand layers and ultimate replacement to some degree by processed sands and ore in the underground mine as backfill will affect the groundwater flow regime, hydrostatic head, near-surface soil water content and spring flow, among other potential consequences. If ASE has performed modeling for these issues, beyond generally describing the impact on the recharge area of some springs, the results are not clearly stated in the Permit. Absent inclusion of information addressing these issues, the Permit should be denied as it fails to provide complete information as required by R317-6-6.3G, and likely has implications for missing additional provisions required by R317-6-6.3.

O. The SPLP (Synthetic Precipitation Leaching Procedure) is documented as an appropriate method for testing for potential hazardous constituents leaching from stockpiles exposed to rainwater and snowmelt. Since the processed ore and tar sands are described in Table 10-1 as having low pH readings, a test method that simulates acid conditions, such as TCLP (Toxicity Characteristic Leaching Procedure), may be indicative of longer-term leachate risks. The Permit fails to disclose whether the TCLP was performed on any samples, and as such, relevant information pertaining to potential leachate risks is missing from the Permit analysis.

This should be provided as required by R317-6-6.3F, -6.3G, -6.3I and further information also may be necessary under other provisions of the application requirements based on the findings of TCLP sampling. The Permit should be denied for inadequately addressing several key components required by regulation.

6. Failure to Comply with Requirements for Contingency and Corrective Action Plans, Closure and Post-Closure Plans and General Failures to Address Various Areas of the Permit Application.

A. The Permit fails to address any contingency or correction plan in the event that watery/wet sand is encountered in the mining process. The Permit does not contemplate a mine dewatering plan, nor does it address the impact such a circumstance would have on surrounding water levels and associated springs. The Permit should be denied unless and until ASE provides adequate information, including provisional plans as required by the permit application and relevant regulatory authority found in R317-6-6.3.

B. The Permit proposes a clay cap and liner system with no synthetic membrane redundancy to protect against uncertainties in design, ground movements, chemical/physical interactions with solvent residuals, etc. The Permit fails to address whether conditions exist that could cause the clay to fracture or split; and it fails to disclose whether other conditions that could cause seepage into shallow groundwater have been evaluated. The Permit also fails to disclose whether the solvent will chemically degrade/biodegrade over time, and if so, what breakdown components and subsequent impacts on liner integrity may result.

C. The Memo also describes a permanent stockpile (at the conclusion of mining activities) that will be 430-feet high, 3,600-feet long, 200-feet wide, and cover 93.5 acres. The footprint of a final tailing facility is noted as 109 acres in the main text, at page 11. The Permit, however, does not address any long-term environmental and visual impacts. The Permit fails to address this issue as part of its closure and post closure analysis, as required by the permit application, and should be denied until additional information is provided by ASE.

The Permit should not be approved without some additional information from ASE addressing this issue, as failure to provide complete information violates requirements set forth in R317-6-6.3.

D. The application indicated that infiltration of storm water through the cap of the tailings pile should be minimal and would be collected in the tile system and used for dust control or evaporated in the hold pond. No analysis, however, was found regarding the amount of precipitation that would fall on to and seep through the tailings pile during the first 5 years of operation when the tailings pile is not completely capped. Additional documentation should be required to determine whether the holding pond is adequately sized to ensure zero discharge to Range Creek during the first 5 years.

E. Page 1 of the Construction Permit lists the plant site storage tanks including but not limited to solvent storage tank; four bitumen storage tanks; raw water tank; two diesel tanks;

bitumen solution tank; two gasoline tanks; and a septic tank. A spill from any of these tanks could cause groundwater contamination. Placing the tanks in a bermed area that will be lined with an impermeable liner, such as HDPE, and that have a total containment of volume of least 110 percent of the volume of the largest tank is intended to minimize the risk if groundwater contamination. The permit and the application, however, do not provide information related to the size and type of each tank listed. Additional information should be provided to determine if tanks of adequate size and type are being used for the volumes and materials stored in accordance with industry-standard requirements.

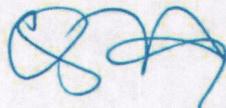
F. Figure 1 of the Permit delineated an area where baseline surveys were conducted for soils, vegetation, wildlife, cultural, and raptors. The application, however, presents almost no information on wildlife and no information at all on cultural resources and raptors in the Affected Area. Further, no results of a survey to identify and delineate potentially impacted waters of the U.S. are presented, and no explicit statements are made as to the presence of federal- or state-listed threatened or endangered species in or around the Affected Area.

As demonstrated throughout these Comments, ASE has failed to comply with the regulatory requirements set forth in R317-6-6.3 that are necessary for the Agency to approve the Permit. Several of the errors and omissions in the Permit are significant, and present critical issues for the protection of water resources within the Agency's administrative oversight. Hunt's real property interests, and economic investment in improving and maintaining sensitive mountain riparian areas and sensitive water resources, including the Range Creek Drainage will be harmed if the Agency does not require ASE to comply with minimum application requirements. Hunt respectfully urges the Agency to exercise its considerable discretion and authority and deny the Permit.

We appreciate the opportunity to comment on the proposed Permit and thank you for your consideration of our comments.

Very truly yours,

WELBORN SULLIVAN MECK & TOOLEY, P.C.



Kelly A. Williams

cc: Mr. Daniel Hall, DWQ
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